eRD14 – homework

Generic Detector R&D for an Electron Ion Collider

Advisory Committee Meeting, JLab, July 13-14, 2017

Q1: Indicate the level of funding received outside of the EIC R&D program for the seven activities listed

1. Domestic (FY17)

- mRICH: $22k for grad student (C.P. Wong), $15k for lab staff building the detector (S. Syed). Machining of mRICH components in GSU shop.
- DIRC: 95% of L.Allison's PhD work on DIRC R&D from ODU grant (5% came from EIC R&D). Setup for lens characterization was covered by ODU, and setup of X-ray source for radiation hardness tests by CUA.
- TOF: $2k from BNL for materials & supplies. 4 UG students + Prof. Rusty Towell, 10 weeks summer 2016, supported by ACU DOE grant. 2 UG students + Prof. Marcus Alfred, 10 weeks summer 2016, supported by NSF VFP grant. 1 UG students, 14 weeks spring 2017, supported by DOE SULI program. IHEP scientists A. Denisov and A. Durum, 1 month FTE (June 2017), in-kind contribution.
- High-B: $20k from Virginia (through ODU) for laser; 3k from USC grant for travel.
- LAPPD: $70k for EIC detector optimization from ANL LDRD.

2. International

- There are also considerable contributions from GSI to the DIRC effort (personnel and synergies with PANDA DIRC R&D) and INFN to the RICH efforts (synergies with CLAS12 R&D). Both are contingent on future support for the detector R&D.

Q2: Provide a relative priority among the seven projects listed and what the impact is on the overall research program if an effort would not be funded

1. Cherenkov detectors (dRICH, mRICH, DIRC) and electronics

- The Cherenkov detectors are the core of the consortium effort and key to the PID capabilities of the EIC. Prematurely terminating one project would mean that the consortium no longer could provide an integrated PID solution
- The electronics is necessary for the prototyping effort

2. TOF and high-B

- TOF: It is important to understand what level of performance can be achieved with an affordable TOF system before pursuing Si-based TOF with similar time resolution, but much shorter flight paths (assuming realistic EIC detector budgets)
- High-B: The effort is essential for the final application, but could be delayed

3. LAPPDs

- The LAPPDs are not needed for the Cherenkov detector R&D effort, which will use commercially available sensors. Ultimately, low-cost photosensors would be desirable, but the link between the R&D and future commercial availability is somewhat unclear.

eRD14 FY18 budget (including overhead)

5.9 Budget by project

	100%	80%	60%
dRICH	$36.5k	$36.5k	$31.5k
mRICH	$99.8k	$81.8k	$64.8k
DIRC	$94k	$75k	$67k
TOF	$43k	$26.5k	$11.5k
high-B	$27.7k	$27.7k	$22.5k
LAPPD	$75k	$50k	$40k
Electronics	$44k	$38k	$29k
Total	***$420k***	***$335.5k***	**$266.3k**

5.10 Budget by institution

	100%	80%	60%
ANL	$75k	$50k	$40k
BNL	$38k	$21.5k	$6.5k
CCNY	$5K	$5K	$5K
CUA (and GSI)	$94k	$75k	$67k
GSU	$66.3k	$53.3k	$42.3k
U. Hawaii	$30k	$30k	$25k
INFN	$52.5k	$41.5k	$26.5k
JLab	$10.5k	$10.5k	$10.5k
USC (and INFN)	$48.7k	$48.7k	$43.5k
Total	***$420k***	***$335.5k***	**$266.3k**